

Puget Sound Refinery
Technical Analysis Report (Rev 0)

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| Event Date and Name | January 24 th , 2010 East Flare Outage Prep – Odor Complaint (Environmental Incident) |
| Process Unit Number(s): | 19 Flare |
| Equipment Number(s) Affected: | 19NF1, 19NC3, 19NC6 |
| Instrument Number(s) Affected: | |
| Discipline (Select most applicable) | Operations |

Event Summary:

At approximately 1:45 PM on Monday January 24, 2010 The HSSE department received a phone call from General Chemical safety supervisor that a very strong odor of H₂S was present at their facility making their staff uncomfortable, although none of General Chemical's plant or personal H₂S monitors alarmed.. Shell personnel performed a fenceline perimeter odor check and IH personnel performed ambient monitoring along the north fence line of PSR. Shell confirmed the reported a sulfur smell on the north side of the plant but no H₂S was detected with their instruments.

Steam had been introduced to the east flare at approximately 12:30 pm to prepare for the planned maintenance outage (the East Flare was being taken out of service due to Flare Pilot leak on top of the stack.) The steam plume from the flare was observed by Shell personnel to be descending directly upon the General Chemical facility. PSR weather station data confirms the average wind direction from 11:30 AM to 2:30 PM was out of the southwest at 131 degrees. Both Gen Chem and Anacortes are directly downwind from this point.

Production reduced and then stopped steam flow to the flare. It is reasonable to assume that the steaming of the east flare was the origin of the strong sulfur odor .

Conclusions:

The steaming of the East Flare was the cause of the odor which resulted in the community complaint.

Corrective Action Taken (if any):

Operations will modify the decon procedures for all flare systems to include

- Steps to flush the Seal pots, and KO drums prior to steam introductions
- Timing of Steam to atmosphere(ex. Nights, Weekends)
- Potential changes or additions of chemical agents to drum prior to steaming (please note that for past flare shutdowns, Zyme flow chemical cleaner was used and worked well to eliminate Benzene numbers, H₂S, and Pyrophorics in the drum prior to Entry).

Application of Learning's to Other Areas (if any):

- The procedures will be updated for the South, North, & East Flare.

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| SME Name: | Jason A. Smolsnik |
| Date of Issue: | 3/8/11 |
| Department: | Northside Production Specialist Ak/SRU/Flares |
| FIM Tracking No./Work Order: | NA |